

Claims:

1. An antenna for communicating with a mesh network comprising:
a plurality of phased array elements adapted to synthesize a radiation pattern for communicating with neighboring nodes of a mesh network; and
a drive circuit for supplying microwave power to the plurality of phased array elements and for controlling a directionality of the radiation pattern.
2. The antenna of claim 1 further comprising:
an enclosure for housing the plurality of phased array elements and the drive circuit, where said enclosure is approximately 3 cm thick.
3. The antenna of claim 1 wherein the plurality of phased array elements are positioned upon a substrate having dimensions of about 25 cm by about 20 cm.
4. The antenna of claim 1 wherein the directionality is switched in P discrete directions, where P is an integer greater than 1.
5. The antenna of claim 4 wherein P is three corresponding to +45 degrees, center, and -45 degrees.
6. The antenna of claim 1 wherein the elevation of the radiation pattern is fixed.
7. The antenna of claim 1 wherein the elevation of the radiation pattern is fixed at an incline from horizontal.
8. The antenna of claim 1 wherein the drive circuit is coupled to a transceiver and modem circuit.
9. The antenna of claim 1 further comprising an enclosure for the drive circuit and plurality of phased array elements, where the enclosure comprises an adhesive element.
10. The antenna of claim 9 wherein the adhesive element is adapted for attaching

the enclosure to a flat surface.

11. The antenna of claim 1 further comprising a multi-layer circuit board that support the plurality of antenna elements, a ground plane, and the driver circuit.

12. The antenna of claim 1 further comprising a foam core substrate for supporting the plurality of phased array elements.

13. An antenna for communicating with a mesh network comprising:

 a multi-layer circuit board having a first side and a second side, with a ground plane formed within the multi-layer circuit board;

 an antenna array, affixed to the first side of the multi-layer circuit board, having $M \times N$ array of antenna elements, where M and N are integers greater than 1;

 a driver circuit, affixed to the second side of the multi-layer circuit board, having a power divider that divides an input microwave signal into M signal paths, a plurality of phase shift circuits are coupled to $M-1$ paths and the output of each phase shift circuit is coupled to an antenna element, one of the M signal paths is coupled directly to an antenna element.

14. The antenna of claim 13 wherein M is 5 and N is 8.

15. The antenna of claim 12 wherein the power divider comprises attenuation in each of the M signal paths.

16. The antenna of claim 13 wherein the phase shift circuits comprise switched hybrid couplers that, in response to a control signal, phase shift the signals on the $M-1$ paths by a discrete phase amount.

17. The antenna of claim 16 wherein the discrete phase shift is at least one of -90 degrees, 0 degrees and $+90$ degrees.

18. The antenna of claim 17 wherein the discrete phase shifts cause a main beam of a radiation pattern formed by the array to be directed 0 degrees, $+45$ degrees and

−45 degrees.

19. The antenna of claim 13 further comprising a modem circuit and a transceiver circuit.